

WHAT IS CLAIMED IS:

1. A method for positioning a plurality of new piles and a new pile cap underneath an existing bridge assembly, the existing bridge assembly having load-bearing and non-load-bearing components, the method comprising the steps of:
 - a) defining an access area in the assembly by removing a portion of the non-load-bearing components of the assembly and by maintaining a substantial portion of the load-bearing components;
 - b) installing the plurality of new piles through the access area; and
 - c) inserting the new pile cap into a gap defined between ends of the piles and the assembly by alternately supporting the new pile cap through the access area.
2. The method of claim 1, wherein the step (a) comprises removing a plurality of cross-ties and a plurality non-load-bearing stingers.
3. The method of claim 1, wherein the step (b) comprises driving a center pile and two opposing outer piles into the ground.
4. The method of claim 1, wherein the step (b) comprises the step of removing proximal ends of the new piles to define the gap.
5. The method of claim 1, wherein the step (c) comprises the steps of:
lowering the new pile cap parallel to a side of the assembly, and
rotating the pile cap perpendicular to the assembly prior to inserting the pile cap into the gap.
6. The method of claim 5, wherein lowering the pile cap parallel to the side of the assembly comprises rotating a boom of a crane less than or equal to 20-degrees from an axial centerline of the assembly.

7. The method of claim 1, wherein the step (c) comprises the step of incrementally moving the new pile cap into the gap by changing support of the new pile cap through the access area at a plurality of positions.
8. The method of claim 7, wherein changing the support of the pile cap through the access area at the plurality of positions comprises the steps of:
 - supporting a plurality of retractable members to a cable of a crane; and
 - alternately connecting at least two of the retractable members to a plurality of support positions on the pile cap.
9. The method of claim 8, further comprising the step of temporarily supporting the pile cap on at least two of the new piles when alternately connecting the at least two retractable members.
10. A system for upgrading an existing bridge assembly with new structures using a crane with a cable, the system comprising:
 - a pile cap for supporting a portion of the new structures having a plurality of lifting points formed therein;
 - an intermediate member having a plurality of support locations being substantially equally spaced as the lifting points; and
 - a first interconnecting member disposed at one of the support locations and being connectable to the cable, the first interconnecting member capable of supporting the intermediate member and capable of releasably connecting to one of the lifting points; and
 - a plurality of second interconnecting members disposed at the other support locations, the second interconnecting members each being capable of interconnecting the support member with one of the plurality of other lifting points.

11. The system of claim 10, wherein the plurality of lifting points on the pile caps comprises:

a first end point adjacent one end of the cap,
a second end point adjacent another end of the pipe,
a central point between the first and second ends, and
one or more third points being substantially spaced at predetermined distances
between the central location and at least one of the end points.

12. The system of claim 10, wherein pile cap comprises a plurality of pipes cast in the pile cap, each pipe having internal threads at an end adjacent a load-bearing surface of the pile cap

13. The system of claim 12, wherein the pipes each comprise an internally threaded end of an oil well drilling pipe.

14. The system of claim 12, wherein the internal threads of at least two pipes are capable of sustaining a load of the pile cap when coupled to at least two of the interconnecting members.

15. The system of claim 12, wherein the pile cap comprises a reinforcing member cast in the pile cap and interconnected with the plurality of pipes.

16. The system of claim 10, wherein the intermediate member comprises a bar having a plurality of apertures defined therethrough at the support locations.

17. The system of claim 10, wherein the first interconnecting member comprises a central rod having first and second ends, the first end having a rotatable member connectable with the cable, the second end having a male member threadable in a centrally located lifting point.

18. The system of claim 10, wherein the second interconnecting members each comprise a rod having first and second ends, the first end having a stop capable of engaging the intermediate member, the second end having a male member threadable in one of the lifting points.
19. The system of claim 18, wherein the male members are capable of being housed in the intermediate member when in a retracted position.
20. A device for lifting a pile cap at a plurality of lifting points on the pile cap using a cable, comprising:
 - a support member;
 - a first rod movably disposed in the support member between extended and retracted positions, the first rod having a first end capable of releasably connecting to one of the lifting points when in the extended position and capable of engaging the support member when in the retracted position, the first rod having a second end capable of connecting to the cable; and
 - a plurality of second rods movably disposed in the support member between extended and retracted positions, each second rod having a first end capable of releasably connecting to one of the lifting points when in the extended position and having a second end capable of engaging the support member when in the extended position.
21. The lifting device of claim 20, wherein the support member comprises a bar defining an internal hollow and having first and second outer surfaces, the bar having a plurality of first apertures defined from the first outer surface to the internal hollow and having a plurality of equally located second apertures defined from the second outer surface to the internal hollow.
22. The lifting device of claim 21, wherein the first end of each second rod has a stop capable of engaging the first outer surface of the bar adjacent the first aperture.

23. The lifting device of claim 22, wherein the second end of each second rod is capable of disposing through the second aperture and being housed in the internal hollow.
24. A pile cap capable of being lifted by a threaded lifting member comprising:
 - a body having a surface,
 - a pipe being cast in the body and having internal threads at a first end adjacent the surface, the internal threads capable of sustaining the pile cap when lifted by the threaded lifting member; and
 - a reinforcing member cast in the body and connected to the pipe.
25. The pile cap of claim 24, wherein the pipe comprises an end of an oil well drilling pipe.
26. The pile cap of claim 24, wherein the pipe has a second end at another surface of the pile cap capable of draining water from the first end.